SUPPLEMENT

TO THE FIRST AID TO THE INJURED

including certain amendments
to the 39th Edition.

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ST. JOHN AMBULANCE ASSOCIATION,
20 TALKATORA ROAD, NEW DELHI.

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47, HOSPITAL STREET
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P. M. DIST-INDIA

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PUBLISHED BY

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20 Talkatora Road, New Delhi.

PREFACE

At the request of the Ambulance Committee of the Order of St. John, we have compiled this supplement to the First Aid Textbook of the St. John Ambulance Association. We understand that a full revision of the Textbook will be undertaken as soon as practicable, but in view of the suggestions and criticisms which have been received since the issue of the 39th Edition of the Textbook in 1937, and the knowledge gained in certain aspects of First Aid by the experiences of the war it has been decided to issue this supplement.

The Supplement, as is clearly indicated therein, is partly a revision of the Sections dealt with, and partly additional matter, and deals with the following subjects :-

Section.	*Chapter of Textbook affected*
Shock	II AND IV
Fractures, particularly fracture of the Spine (including transport)	VI
Wounds and Hæmorrhage	IX
Artificial Respiration, including in the Appendix to the Supplement a description of the Rocking Stretcher method of Artificial Respiration	XI
Miscellaneous Injuries—Burns and Scalds	XV
Transport of Injured Persons	XVIII

We wish to express our appreciation of the many suggestions and criticisms submitted, all of which have been most carefully considered.

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November, 1945.

SHOCK.

Delete Rule 12 on pages 25 and 26 of the first 29 Impressions or pages 23 and 24 of later Impressions; and for Chapter IV substitute the following :—

Shock is a condition which results from, and occurs after every accident, and is of the greatest importance in First Aid in-as-much as it is the chief cause of death when the patient is not killed outright. It is the "State of Prostration" arising from the sudden depression of all the vital activities; which results from injury, or the emotional reaction to an unpleasant sight or bad news. It may vary from a slight feeling of faintness to a condition of collapse in which death may occur from exhaustion of the vital forces of the body.

The First-Aider should appreciate that there are two types of shock, viz. : (1) "Primary"; and (2) "Secondary" or "Surgical."

(1) **Primary Shock.** This condition starts at the moment of injury, and is the result of the actual injury, aggravated by pain or fright. It is probably "Nervous" in origin, and owing to its immediate onset necessitates instantaneous first aid

treatment. It is characterised by a sudden fall in blood pressure, giving rise to the following **Signs and Symptoms** which, it should be noted, may **be present in widely different degrees:**—

i. The face and lips are pale, with "beads of cold sweat" appearing on the forehead.

ii. The skin is cold and clammy.

iii. The pulse is rapid and feeble, or may be imperceptible at the wrist.

iv. There is general weakness resulting from loss of muscle tone.

v. There is giddiness and clouding of consciousness.

Course of Primary Shock.

(*a*) The condition may pass off within a short time, seconds or longer according to the severity of the case.

(*b*) The condition may be prolonged into the state of Secondary Shock, without any period of recovery. This is uncommon but extremely grave.

(*c*) The condition may be so severe, that the patient may die within a few minutes unless all possible steps are taken to lessen its gravity.

(2) **Secondary or Surgical Shock.** This results from serious injury causing loss of blood, from crushing injuries, from fracture of large bones such as the femur or spine, from burns, especially of the face, chest and abdomen, etc. The onset may occur within one to ten hours after the injury was sustained, so that normally the condition does not come within the province of first aid treatment. It should be anticipated, however, in all cases of severe injury and its onset prevented by adequate treatment when Primary Shock is noticeable.

In this condition there is not only a fall of blood pressure but also a reduction of the circulating blood volume. These are responsible for the characteristic **Signs and Symptoms,** which are :—

i. The face and lips are pale, with "beads of cold sweat" appearing on the forehead. In more severe cases the pallor tends to become blue, grey or even leaden. The blueness is first noted in the lobes of the ears and the lips.

ii. The skin is cold and clammy.

iii. The pulse is rapid and feeble, or may be imperceptible at the wrist. A pulse of 100 per minute, or over, indicates a serious condition.

iv. The breathing is shallow, and if the condition is caused or complicated by severe hæmorrhage, air hunger may supervene. (See page 136 of the first 29 Impressions or page 119 of later Impressions.)

v. The eyes have a glassy or vacant stare, and the pupils are dilated. The more dilated are the pupils, the more serious is the case.

vi. There is general weakness, resulting from loss of muscle tone.

vii. There is a feeling of faintness, and sometimes dizziness and nausea. If this condition progresses the patient becomes duller and confused, and stupor or coma may supervene.

Shock will be increased by loss of blood, exposure to cold, severe pain, mental anxiety. Treatment is designed to combat these factors.

(A) **Immediate :—**

1. Arrest severe hæmorrhage if present.

2. Lay the patient on his back, on a blanket, steadying and supporting any injured part. Place his head low, and turn it to one side.

3. Loosen clothing about the neck, chest and waist, and ensure a free circulation of air.

4. Prevent aggravation of injuries, using temporary or standard methods according to the needs and circumstances of the particular case. Handle the patient carefully and gently throughout, and keep him comfortable.

5. Raise well the lower limbs.

6. Keep the patient warm by covering him with coats and blankets, and, if available, by applying hot water bottles to the sides of the body, between the legs, and to the feet. The strictest

care must be taken to ensure that the patient does not get burned, especially when the skin is insensitive.

It is **essential** that the patient be not overheated to the point of sweating, as this further reduces the fluid in the body and so increases shock.

7. Stimulate the patient by such methods as are immediately available, bearing in mind that nothing must be given by the mouth when injury to an internal organ is present or suspected, When the patient is able to swallow, strong tea or coffee with plenty of sugar, meat extracts or milk as hot as can be drunk, or a teaspoonful of sal volatile in half a tumbler of water may be given. Ampoules of ammonia may be crushed in a handkerchief and the vapour inhaled. Smelling salts, the strength of which should first be tested, may be held to the nose. Sprinkling the face with cold and hot water alternately, warmth applied to the pit of the stomach and over the heart, and vigorous friction of the limbs upwards have a stimulating effect. It is incorrect to suppose that alcohol is the only form of stimulant. Too frequent use of spirits is made to restore a patient

after an accident, often with serious results; the administration of alcohol must therefore be withheld until ordered by the doctor.

8. **In the event of crush-injury involving a limb,** if no doctor is immediately available, and **before** giving the patient stimulant treatment (as in para. 7), he should be given as much weak alkaline solution as he is able to take by the mouth, a suitable solution being one level dessertspoonful of bicarbonate of soda dissolved in each pint of water. If no alkali is available plain water may be used. The fluid should be given if possible before the limb is released. Note should be made of the quantity of fluid and alkali administered.

9. Ensure freedom from exitement and worry. Do not discuss the patient's condition or injuries within his hearing.

10. Remove the Patient to shelter. **Patients suffering from severe shock, and therefore in danger of losing their lives, must be removed to hospital on a stretcher immediately for special anti-shock treatment, such as blood transfusion. Patients suffering from the**

effects, of crushing should invariably be removed to hospital immediately even if there are no apparent indications of shock.

(B) **On Arrival at Shelter:—**

1. Continue with such methods of stimulation as are possible.

2. Examine for and treat all injuries.

3. Maintain careful watch on the patient's general condition, pending arrival of medical aid or ambulance.

FRACTURES.

The following paragraphs are supplementary to Rules 4 and 5 on pages 66-69 of the first 29 Impressions or pages 59-62 of later Impressions.

The scope of the First-Aider in the treatment of Fractures is not necessarily to set the fracture accurately, but to maintain the broken ends in a fixed position so that they shall not cause further injury to the tissues round about them.

No great extension can be maintained on the ends of the broken bones by the means available to the First-Aider; but any extension which can be maintained plays a considerable part in the immobilisation of the broken ends and in the relief of pain at the site of the injury.

In limb fractures, to maintain some extension and give the maximum amount of immobilisation, the method of choice is the well-padded splint or splints, and when available they should be used.

When they are not available, the body itself may be used as a splint, and the upper limbs may be fixed in various ways to it. The lower limbs may be fastened to one another.

A general method for dealing with any fracture of the upper limb is carefully to remove the coat if possible; straighten the limb by gentle and steady extension; bend the elbow and lay the limb against the chest with the hand just touching the opposite shoulder. The hand may be fixed in this position by a bandage looped round the wrist and tied round the neck, taking care that there is no constriction at the wrist. The limb is then bound firmly to the chest by a broad bandage or similar method, the coat replaced and buttoned over the fractured limb. This method may also be used for fractures of the shoulder-blade and collar-bone.

If triangular bandages are available, the standard method for fracture of the collar-bone is preferable.

In the lower limb, if no splinting facilities are available, extend the broken limb, and tie the ankles and feet together with a figure of 8 bandage. If padding is available, pad between the legs Fasten the knees together with a broad bandage. Bandage above and below the fracture.

Transport should be particularly careful when no splints are used.

FRACTURE OF THE SPINE.

For pages 72-77 and Rules 6 and 7 on page 78 of the first 29 Impressions or pages 64-68 and Rules 6 and 7 on page 69 of later Impressions, substitute the following :—

The vertebral column may be broken either by direct or indirect violence. Examples of direct violence are the fall of a heavy weight across the back, or falling from a height on the back across a bar, causing fracture at the site of impact. Examples of indirect violence are the broken neck which may result from a fall on the head ; the fracture in the lumbar region due to overflexion following a heavy weight dropped suddenly on to the back of the shoulders ; and the over-jerking of the spine resulting from sudden overflexion and recoil when a rope attached to a heavy weight or resistance which is being pulled over the shoulder suddenly snaps, so that the resistance to the flexion of the spine is lost. All occasional grave complication of fracture of the spine is injury to the spinal cord, or to the nerves issuing from it, from pressure by displaced bony fragments, resulting in complete or partial loss of power and sensation (Paralysis) in all parts of the body below the site of the injury.

Fracture of the spine should be suspected in all cases where there is a history of accident or injury to the vertebral column, with pain and shock, even if there are no indications of paralysis. All doubtful cases should be treated as a fracture.

RULES FOR TREATMENT IN ALL CASES OF SPINAL INJURY.

If Medical Aid is readily avialable:—

1. Immediately warn the patient to lie still.

2. Without moving him, keep him as warm as possible by means of blankets and hot water bottles, bearing in mind that the trunk and limbs may be insensitive and so easily burned.

3. Keep careful observation on the patient pending arrival of medical aid.

If Medical Aid is not readily available:—

1. Immediately warn the patient to lie still.

2. Place pads between the patient's ankles, knees and thighs.

3. Apply a bandage in the manner of a figure-

of eight round ankles and feet, the knot being tied under the soles of the feet.

4. Apply broad bandages round knees and thighs over the intervening pads.

5. Empty side- and back-pockets.

6. Remove the patient to appropriate shelter as follows:—

METHOD OF TRANSPORT.

1. In all cases of fracture of the spine, the patient must be transported **ON HIS BACK**, *i.e.*, in the supine, or face-upwards position. If found in any other position, he must slowly and evenly be rolled on to his back, with the greatest possible care and using all available assistance. All cases should be treated as serious emergencies.

2. If the patient is unconscious, ensure that breathing does not become obstructed by the tongue.

3. In moving or lifting the patient, he must not be bent, twisted or over-extended at the site of injury. This is particularly important in cases of fracture-dislocation, especially in the movable

parts of the spine, *i.e.*, the cervical and lumbar regions.

4. The entire bed of a "Furley" type of stretcher must be stiffened, preferably with a series of short transverse boards. (The metal bed portion of a Civil Defence stretcher is sufficiently rigid and does not require extra support.) If no stretcher is available, a narrow shutter, door or board of at least the same width and length as the patient may be used.

Cover the stretcher with a folded blanket and then "blanket" the stretcher as on page 43 hereof.

5. Irrespective of the site of injury, place in readiness on the stretcher, in a position to support the neck and small of the back of the patient, pillows or pads sufficiently large, but not too large, to preserve the normal curves of the spine.

6. Lift and place patient on the stretcher, varying the method (see para. 12 below) according to material and number of helpers available, using the greatest care and ensuring that the whole length of his back, head and lower limbs are kept straight.

7. In the case of cervical injuries, place firm supports such as sandbags on each side of the head to steady it.

8. Place a folded blanket beneath the calves so as to relieve pressure on the heels.

9. Wrap the patient as on page 43 hereof.

10. If he is to be carried over rough ground, minimise his body movements by binding him firmly, but not too tightly, to the stretcher with broad bandages round the pelvis, thighs and calves.

11. On arrival at shelter, do nothing further until the arrival of medical aid.

12. **Methods of Loading Stretcher:—**

In all cases it is necessary for one bearer to apply gentle traction at the head by placing the palms of his hands on the patient's ears with the fingers at the back of the neck and the thumb over the angle of the jaw; and for one bearer to apply gentle traction at the feet by grasping the patient's ankles from their outer sides.

Traction at the head and feet will be continued until the patient has been placed on the stretcher.

All cases of spinal injury should be loaded on to the stretcher feet first. In cases where the stretcher is pushed under the patient, it will be necessary for the bearer at the feet to keep his legs wide apart to allow the stretcher to be placed between them ; in cases where the patient is carried to the stretcher, the head of the stretcher should be placed as close to the feet of the patient as convenient before proceeding to lift.

Method A. (To be used when poles and bandages are available.)

1. Apply traction as above.

2. Without moving the patient, pass looped broad bandages from alternate sides under the natural hollows of the body (the neck, loins and knees) ; without jerking, work them into position under the head, the shoulder-blades, buttocks, thighs and calves.

3. Pass long poles, pitchfork handles, etc., through the loops on each side. Tie the free ends of the bandages over the poles.

4. Place the patient on the stretcher as follows:

(*a*) *If 7 bearers are available.* While the two bearers maintain traction, four others should stand two on each side of the patient facing one another. On the word of command, they stoop down, grasp the poles firmly with hands well apart (see Fig A hereof), and acting together, carefully and evenly lift the patient sufficiently high to enable the remaining bearer to push the stretcher under.

(*b*) *If only 6 bearers are available,* they should lift the patient as in (*a*) above, and then move with short, even paces until the patient is directly over the stretcher.

(*c*) *If only 5 bearers are available.* While the two bearers maintain traction, two other bearers should stand one on each side of the patient facing one another. On the word of command, they stoop down and grasp the poles firmly, the hands well apart opposite shoulders and thighs. Acting together they then carefully and evenly lift the patient sufficiently high to enable the remaining bearer to push the stretcher under.

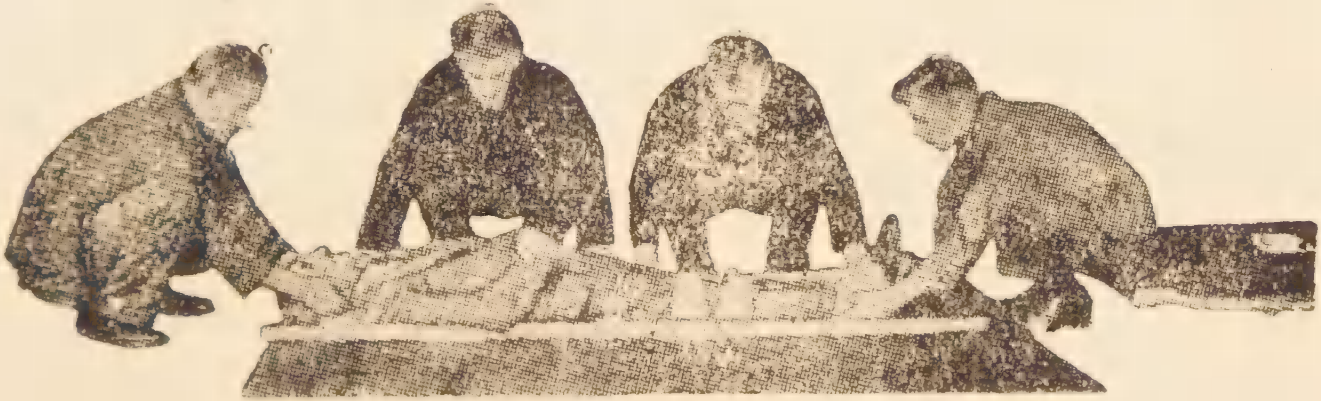

FIG. A.

The two bearers who would normally appear on the right of the patient have been omitted from the illustration for clarity.

(*d*) *If only 4 bearers are available*, they should lift the patient as in (*c*) above and then move with short, even paces until the patient is over the stretcher.

Method B. (To be used when only a blanket is available.

1. Place the blanket on the ground in line with the patient and rolled lengthwise for half its width.

2. The two bearers apply gentle traction to the head and feet, while the other bearers very carefully turn the patient on to his side, every precaution being taken to prevent movement at the site of the fracture.

Place the rolled portion of blanket close to the patient's back (see Fig. B hereof) and gently roll him over the roll until he is lying on his opposite side. Unroll the rolled portion of the blanket and gently lower the patient on to his back so that he lies in the centre of the open blanket. **The bearers at the head and feet conform to the rolling of the patient throughout.**

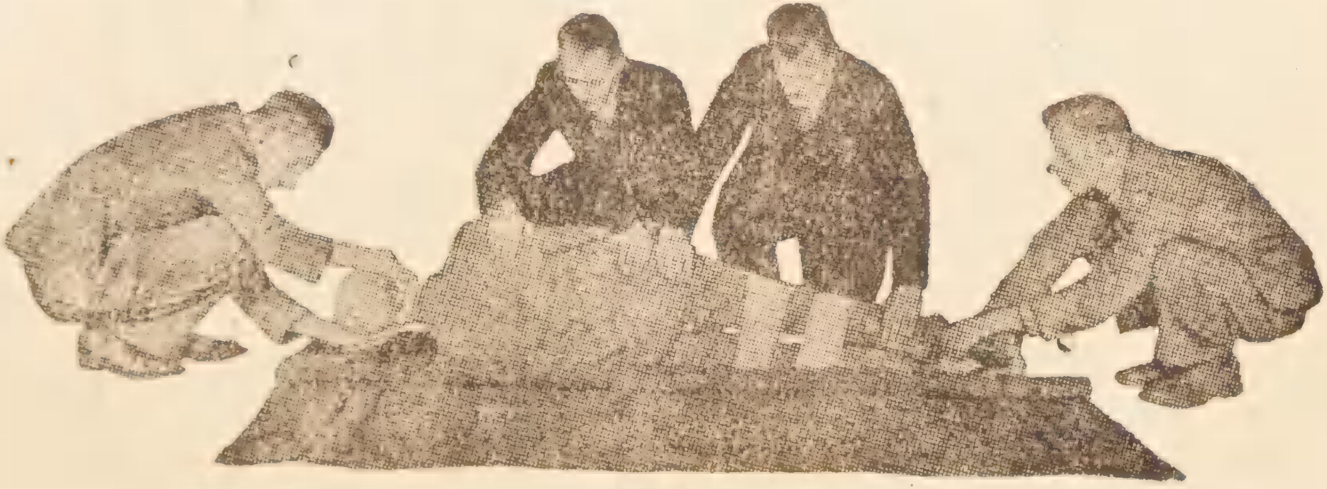

FIG. B.

3. Roll the two edges of the blanket up against the patient's sides.

4. Place the patient on the stretcher as follows:

(*a*) *If 7 bearers are available.* While the two bearers maintain traction, four others should stand two on each side of the patient and grasp the rolled edges of the blanket. On the word of command the bearers, acting together, lift the patient carefully and evenly, sufficiently high to enable the remaining bearer to push the stretcher under.

(*b*) *If only 6 bearers are available,* they should lift the patient as in (*a*) above and then move with short, even paces until the patient is directly over the stretcher.

(*c*) *If only 5 bearers are available.* The two bearers who maintain traction at the head and feet momentarily relax traction in order to incorporate the rolled edges of the blanket in their hold. Two others should stand one on each side of the patient facing one another, and grasp the rolled edges of the blanket on each side with the hands wide

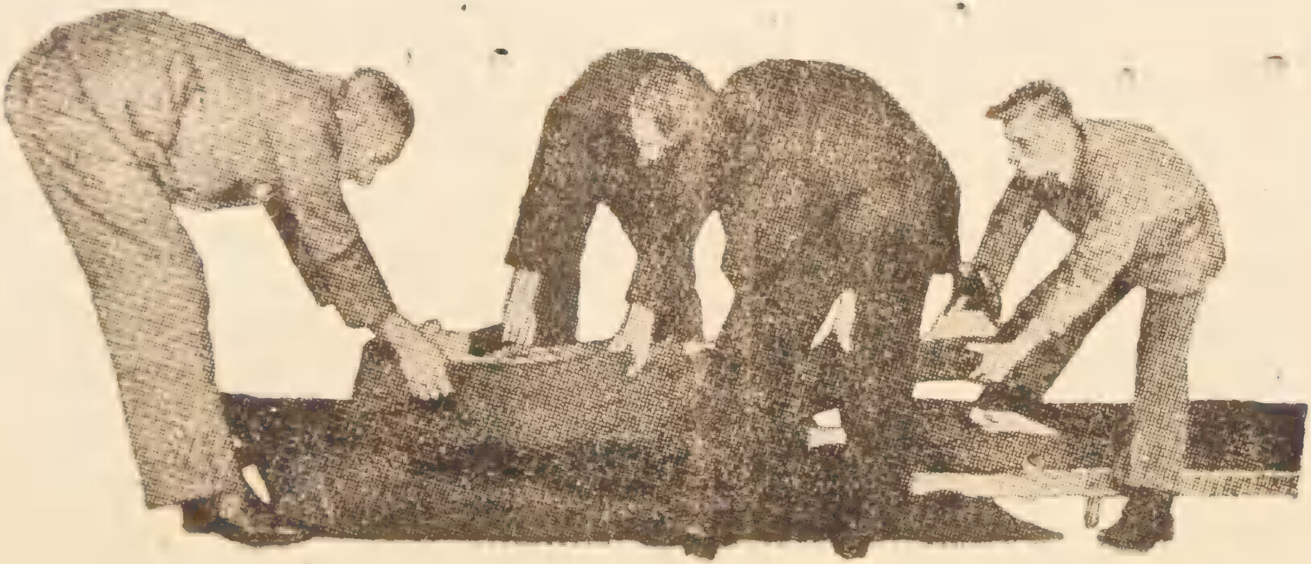

FIG. C.

apart and opposite his shoulders and thighs. On the word of command the bearers, acting together, lift the patient carefully and evenly, sufficiently high to enable the remaining bearer to push the stretcher under. (See Fig. C hereof.)

(*d*) *If only 4 bearers are available*, they should lift the patient as in (*c*) above and then move with short, even paces until the patient is directly over the stretcher.

Method C. (To be used when Methods A and B are impossible through lack of material.)

1. Apply traction as above.

2. Open out the patient's coat and roll it firmly so that the roll is close to his sides.

3. Place the patient on the stretcher as follows:

(*a*) *If 7 bearers are available.* While the two bearers maintain traction, four others should stand two on each side of the patient and grasp the rolled-up coat and the clothing or the bandage round the patient's thighs. On the word of com-

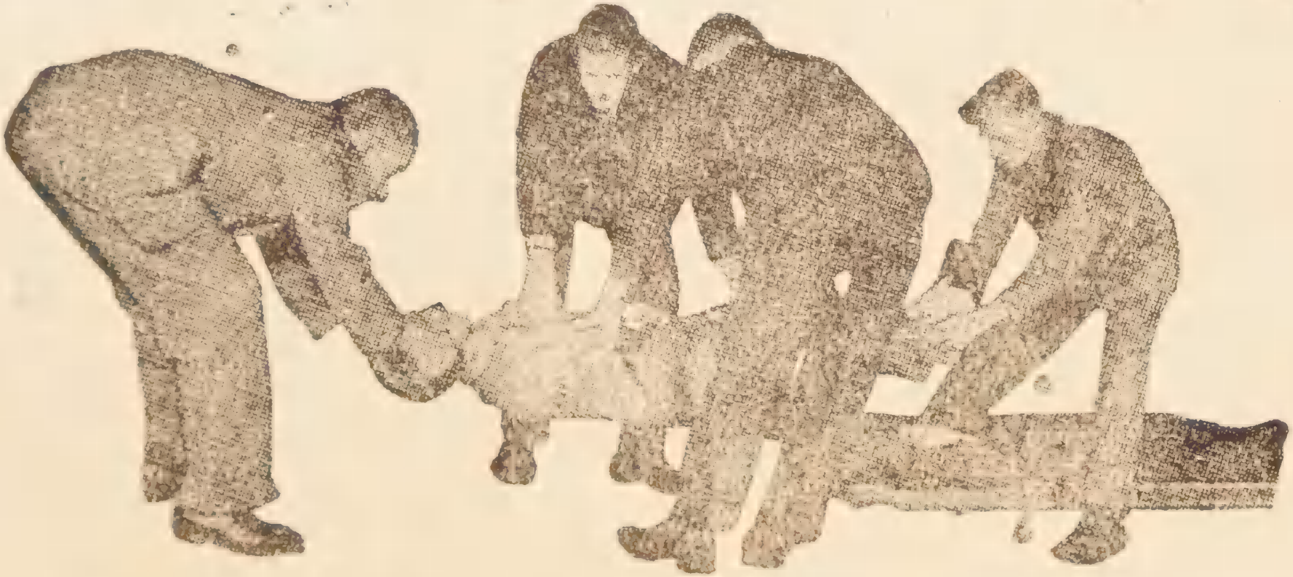

FIG. D.

mand, the bearers, acting together, carefully and evenly lift the patient sufficiently high to enable the remaining bearer to push the stretcher under.

(*b*) *If only 6 bearers are available,* they should lift the patient as in (*a*) above and then move with short, even paces until the patient is directly over the stretcher.

(*c*) *If only 5 bearers are available.* While the two bearers maintain traction at the head and feet, two others should stand one on each side of the patient and grasp the rolled up coat, and the clothing or the bandage round the patient's thighs. On the word of command the bearers, acting together, carefully and evenly lift the patient sufficiently high to enable the remaining bearer to push the stretcher under. (See Fig. D hereof.)

(*d*) *If only 4 bearers are available,* they should lift the patient as in (*c*) above and then move with short, even paces until the patient is directly over the stretcher.

WOUNDS AND HÆMORRHAGE.

The following section supersedes pages 104-112 of the first 29 Impressions, or pages 92-98 of later Impressions; and, with the exception of the pressure points for the carotid, subclavian and femoral arteries, it also supersedes pages 113-130 (to end of Rule 10) of the first 29 Impressions, or pages 99-114 (to end of Rule 10) of later Impressions.

A Wound is a break in the continuity of the tissues of the body which permits the escape of blood and the entrance of disease-producing germs or other injurious agents.

Wounds may be classified as follows :—

1. **Incised Wounds**, which are caused by a sharp instrument, such as a razor, and bleed freely, as the blood vessels are "clean cut."

2. **Lacerated Wounds**, which have torn and irregular edges. They are caused by such things as machinery, a piece of shell or the claws of an animal. As the blood vessels are torn through, lacerated wounds bleed less freely than incised

wounds, and the bleeding may be delayed for a time.

3. **Contused wounds**, which are accompanied by bruising of the tissues, and are caused by a direct blow by some blunt instrument or by crushing.

4. **Punctured wounds**, which have comparatively small openings, but may be very deep and are caused by a stab from any sharp-pointed instrument. such as a needle, knife or bayonet.

Gun-shot wounds come under one or more of the above headings.

Hæmorrhage, or bleeding, is of four kinds :—

(1) Arterial. (2) Venous. (3) Capillary.
(4) Mixed.

ARTERIAL HÆMORRHAGE

1. Blood from an artery is bright red.

2. If the wounded artery is near the skin the blood spurts out in jets corresponding with the pulsation of the heart.

3. Blood issues from the side of the wound nearer to the heart.

VENOUS HÆMORRHAGE.

1. Blood from a vein is dark red.

2. It flows in a steady, continuous stream.

3. It issues from the side of the wound further from the heart.

CAPILLARY HÆMORRHAGE

1. The blood is red.

2. It may flow briskly in a continuous stream or merely ooze from all parts of the wound.

MIXED HÆMORRHAGE.

Owing to the fact that in most cases large arteries and veins lie close together, it is very common to get arterial and venous hæmorrhage together. For this reason the First-Aider must always be prepared to deal with the arrest of mixed hæmorrhage.

The blood may spurt out of the wound, but more frequently it gushes out from the **depth of the wound.**

Arterial, venous and mixed hæmorrhage are serious conditions and must have immediate treatment.

Capillary hæmorrhage is not so serious and is more easily controlled.

OBJECTS OF TREATMENT OF WOUNDS.

(1) To stop the bleeding—

As a clot of blood is Nature's method of stopping bleeding it should never be disturbed when present over a wound. A blood clot serves the double purpose of keeping blood in and germs out.

(2) To lessen the effects of shock.

(3) To prevent contamination (sepsis) caused by the entrance of minute living organisms called germs, which are present in the air, in water, and on all surrounding objects, such as the hands, clothes, etc.

It is very easy to introduce germs into a wound, however small :—

(*a*) by unnecessarily touching it or the dressing which is to be applied unless the hands are perfectly clean and have been made sterile by the application of an **antiseptic**.

(*b*) by washing it with water which has not been rendered sterile by being boiled and allowed to cool, or by the addition of an antiseptic.

(*c*) by leaving it exposed to the air.

An **antiseptic** is a chemical substance which has the power of restraining the growth of germs. Any standard antiseptic is suitable for the sterilisation of the hands, but in wounds and on the skin adjacent no antiseptic which burns or irritates should ever be used as it tends to destroy the healing properties of the tissue cells. Staining antiseptic are also undesirable on account of their destructron of clothing.

When the ideal antiseptic is not available, normal saline solution (one teaspoonful of common salt to one pint of sterile water) should be used.

Antiseptic lotions should not be used unless circumstances are favourable, such as in a house, or ambulance room, where care can be exercised in their correct preparation and application.

To ensure as far as possible the cleanliness of all dressings used:—

(1) Spread out a clean handkerchief, triangular bandage or towel, and on it place all the necessary material.

(2) (*a*) If using a sterilised dressing remove the outer envelope, sterilise the fingers and open the inner package; remove the dressing, taking care to expose it as little as possible to the air, and avoid fingering the surface of the dressing. After sterilising the fingers care must be taken not to handle anything which is not clean.

(*b*) If a sterilised dressing is not available sterilise the fingers, cut a piece of clean gauze, lint or boracic lint, to the required size, and apply to the bound. Avoid touching the side of the dressing which is to be placed next to the wound.

(3) After the dressing is completed, again sterilise the fingers and replace the unused dressings in a clean container.

GENERAL RULES FOR TREATMENT OF WOUNDS ACCOMPANIED BY CAPILLARY HÆMORRHAGE.

(1) Expose the wound, removing only whatever clothing may be necessary.

(2) Remove any foreign bodies which are visible and easily removed. All others are left severely alone.

(3) Apply a clean dressing and bandage firmly.

GENERAL RULES FOR TREATMENT OF WOUNDS ACCOMPANIED BY ARTERIAL, VENOUS OR MIXED HÆMORRHAGE.

(1) Place the patient in a suitable position, bearing in mind that blood escapes with less force when the patient sits, and still less when the patient lies down.

(2) Elevate the bleeding part, except in the case of a fractured limb.

(3) Expose the wound, removing only whatever clothing may be necessary.

(4) Remove any foreign bodies which are visible and easily removed. All others are left severely alone.

(5) Apply direct pressure with the thumb or thumbs to the part which is bleeding. Pressure over a pad may be used if a pad is immediately available. If the bleeding point is not readily visible grasp the whole wound area and squeeze it tightly. This will nearly always stop the bleeding for a time, and, by relaxing slowly, the bleeding point will be found and pressure then applied with the thumb.

(6) For thumb pressure substitute dressing and pad pressure. A suitable sized dressing and pad are placed over the wound and pressed firmly down.

Deep wounds may need further pads on top of the first, thus pressing the dressing into the depth of the wound.

Ensure that the pads project well above the level of the skin.

(7) Bandage the pads firmly in position. The bandage should not be applied more tightly than is sufficient to stop the bleeding.

If blood still soaks through the dressing and pads, apply further dressings and pads on top with a fresh bandage, but do not remove the original ones.

(8) Where a foreign body or broken bone is present in a wound, build the dressings and pads round it to a sufficient height to allow for the complete covering of the wound and for pressure to be applied by the bandage without pressing on the foreign body or broken bone. This has somewhat the effect of a ring pad used for smaller wounds of this character. (See page 37 hereof).

(9) If bleeding is not controlled by the application of pad and bandage to the wound—or, on the rare occasions when bleeding is not controlled by the method set out in Rule 8—it is necessary to apply a firm bandage round the limb a few inches above the wound. It is preferable to use a rubber bandage 4 feet long and 2½ inches wide, with a tape attachment at the end for fastening. At the end of every 20 minutes the

bandage should be relaxed ; if bleeding has not ceased the bandage must be re-tightened.

This bandage will also be required in the case of an amputated limb.

(10) Keep the injured part at rest by supporting it in a sling or bandaging it to the body, or if necessary, in severe wounds and wounds near joints, by the application of splints.

(11) When bleeding has stopped :—
Keep the patient warm.
Give plenty of fluids, especially warm tea if available.

(12) When it is impossible to apply direct pressure successfully for the arrest of arterial hæmorrhage as in the case of wounds in the throat, high up in the arm and high up in the thigh, it is necessary to apply indirect pressure to the carotid, subclavian or femoral pressure points (as the case may be) as indicated on pages 114, 118 and 124 of the first 29 Impressions or pages 100, 104 and 109 of later Impressions.

Ring Pad. To make a ring pad, pass one end of a narrow bandage round the fingers ; pass the other end of the bandage through the ring thus formed and continue to pass it through and through until the whole of the bandage is used and a ring as shown in Fig. 64 is formed.

WOUNDS CAUSED BY A VENOMOUS SNAKE OR RABID ANIMAL.

Pages 132-135 of the first 29 Impressions or pages 115-118 of later Impressions will not in future be included in the syllabus of Examinations in the United Kingdom

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THE RESPIRATORY SYSTEM.

The following paragraphs are supplementary to Chapter XI :—

As it is of vital importance that there should be a free passage of pure air in and out of the chest, it is necessary to ensure that the air passages are not obstructed and that pressure does not prevent the necessary movements and expansion of the chest. All foreign matter such as false teeth, weeds or vomited food must therefore be removed from the mouth and pharynx.

Warmth and protection from the elements should also be provided as far as possible throughout.

As it is the First-Aider's duty to perform artificial respiration immediately, he should not waste time by loosening the patient's clothing except when it is necessary to ensure the free passage of air and the movements of the chest. He should utilise the assistance of bystanders to remove damp clothing and to provide warmth and protection from the elements.

When performing artificial respiration it is important that the movements of pressure and relaxation be carried out smoothly and rhythmically.

If no helpers are available and it is necessary to use Silvester's Method of artificial respiration, the head of the patient should be turned as far as possible to one side to prevent obstruction of the windpipe through the tongue falling back over the top of it.

MISCELLANEOUS INJURIES.

BURNS AND SCALDS.

For the sections marked A and B on page 178 to the end of Rule 5 on page 179 of the first 29 Impressions, or page 153 of later Impressions, substitute the following :-

The First-Aider should remember that most burns and scalds are fundamentally sterile for a short period following their cause, and every effort should be made to keep them so until arrival at hospital. Sterilized dressings should always be used whenever available, and great care be taken in their handling and application.

If possible, the First-Aider should wash his hands carefully before handling the case.

A. **When medical aid or hospital is readily available.**

1. Do **not** remove clothing and do **not** break blisters.

2. Cover the area with sterile dressings, lint, gauze or freshly laundered handkerchiefs or sheets.

3. Bandage firmly unless blisters are present or suspected, when bandage lightly.

4. Wrap the patient warmly in blankets.

5. Give large quantities of warm, weak, sweet tea.

6. Transport to hospital quickly.

B. When medical aid or hospital is not readily available.

1. Do not remove clothing and do not break blisters.

2. Saturate the area with warm alkaline solution (one dessertspoonful of baking soda to one pint of warm water), or warm saline solution (one teaspoonful of common salt to one pint of warm water).

3. Cover the area with lint, gauze, or linen soaked in similar solution.

4. Bandage the dressings firmly in position unless blisters are present or suspected, when bandage lightly.

5. If the above solutions are not available cover the area with sterile dressings, lint, gauze or freshly laundered handkerchiefs or linen until such times as the solutions are available.

6. Wrap the patient warmly in blankets.

7. In severe cases the affected area should be immobilised by slings, bandages or splints.

8. Give large quantities of warm, weak, sweet tea.

TRANSPORT OF INJURED PERSONS.

Where a blanket or rug or carrying-sheet has been placed under a patient, it will usually be possible to make use of this in loading. In the case of blanket or rug, the edges should be firmly rolled close up to the patient, and the bearers, two on each side, should grasp the rolls and carefully lift while a fifth bearer pushes the stretcher underneath.

Carrying-sheets should be made use of whenever available. They are a great asset when handling injured patients.

The following methods of "Blanketing a Stretcher" and of "Wrapping a Patient" supersede the instructions in Figs. 91, 92 and 93 to which reference is made in Rules 5 and 8 on pages 206 and 211 respectively of the first 29 Impressions, or pages 177 and 181 of later Impressions.

Blanketing Stretcher.

1. Place the first blanket lengthwise across the stretcher with one edge covering half the handles at the head end, and with the whole of the blanket slightly more to one side of the stretcher than the other. (Fig. E. hereof).

2. Fold the second blanket lengthwise in three and lay it on the stretcher with the upper edge about fifteen inches below the first blanket.

3. Open out the folds of the second blanket at the lower end for about two feet (Fig F hereof).

Wrapping the patient.

Place the patient on the four thicknesses of blanket on the stretcher and :—

1. Bring the foot of the second blanket up over the feet, tucking in a small fold between the feet. (Fig. G hereof).

2. Bring the sides of the folds of this blanket over the feet and lower part of the legs and tuck in.

3. Turn in the upper corners of the first blanket and bring the shorter end over the patient, then the longer end over and tuck in well. (Fig. 11 hereof).

4. If a third blanket is available it should be doubled lengthwise and laid over the patient before the patient is tucked in.

The following paragraph modifies the position of No. 4 bearer shown in Fig. 94, 95, 96 and 97 and supersedes Rule 6 on page 207 of the first 29 Impressions or on page 177 of later Impressions:-

Load Stretcher.

The bearers turning inwards together and kneeling on the left knee will pass their hands beneath the patient. (When lifting the patient from his right side, the bearers will kneel on the right knee.) No. 2 supports the legs, Nos. 1 and 3* (joining hands by the "Hook-Grip") the thighs and hips, No. 4 the upper part of the trunk, with his left arm just below the shoulder-blades and his right arm supporting the head and shoulders. In lifting the patient off the ground special care must be taken of the injured part, No. 1 giving the necessary instructions.*

---

*Note.

No. 1, instead of joining both hands with No. 3, may join his left hand with the left hand of No. 4, and his right hand with the right hand of No. 3.

Bearers may find that this gives a better distribution of the weight.

ROJA MUTHIAH
47, HOSPITAL STREET

APPENDIX

THE ROCKING STRETCHER METHOD OF ARTIFICIAL RESPIRATION.

(1) Commence Schafer's method of Artificial Respiration immediately. Do not take the patient to the Rocking Stretcher; the stretcher must be brought to the patient.

(2) On arrival of the Rocking Stretcher, lift the patient on to the stretcher without breaking the continuity or rhythm of the Schafer method, ensuring support for the head, and a clear airway. Lash the wrists and feet to the handles.

(3) When the patient is lashed in position, cease Schafer's method and start rocking, commencing with a head-down tilt of 45 degrees, so as to empty any water in the stomach or lungs. (Do not commence the feet down tilt until the water has stopped flowing out, otherwise it might be sucked into the lungs.)

4. Alternate the rocking movements head down, and feet down at an angle of 45 degrees, regulating the rate to ten double rocks per minute, *i.e.*, 4 seconds head-down, and 2 seconds

feet-down, and continue until breathing is restored or life is pronounced extinct. (When improvising the rocking stretcher, using a standard 7ft. 9ins. stretcher, it will be found that the centre of the stretcher must be pivoted 34ins. above the ground to obtain the necessary angle of rocking.)

(5) A specially devised stretcher, which can be fitted with apparatus for administering oxygen and carbon-dioxide, should be used if available.

(6) The patient must be kept warm by means of blankets, hot water bottles and impervious coverings.

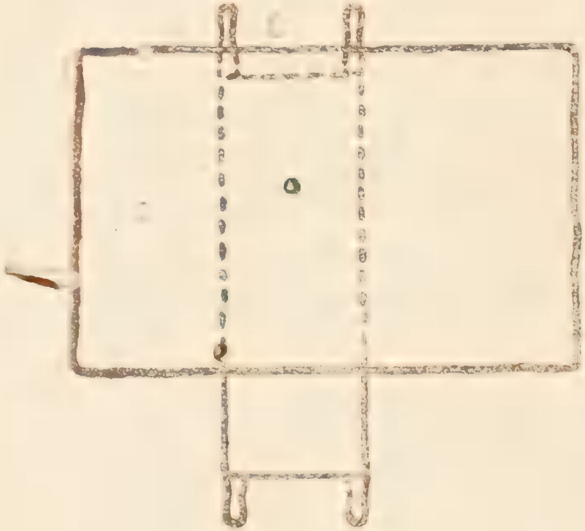

FIG. E.

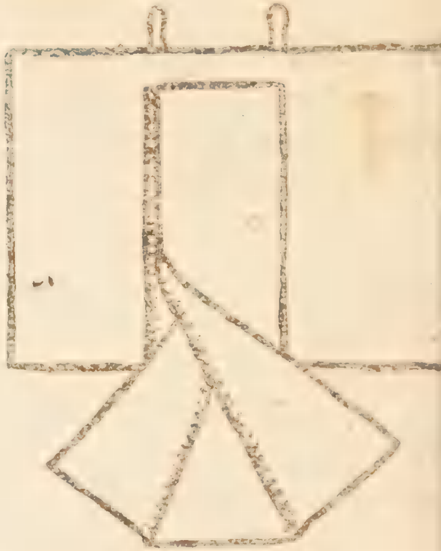

FIG. F.

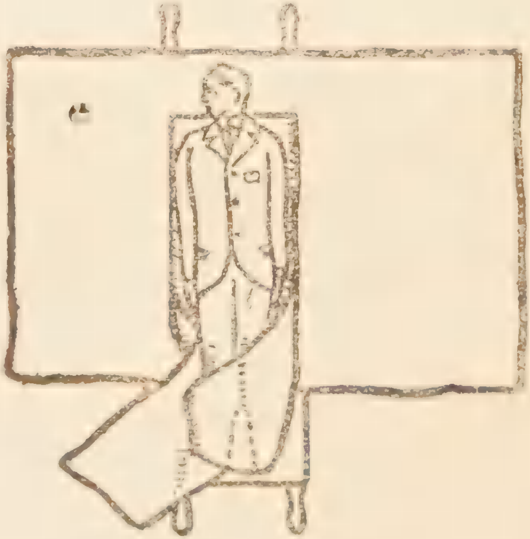

FIG. G.

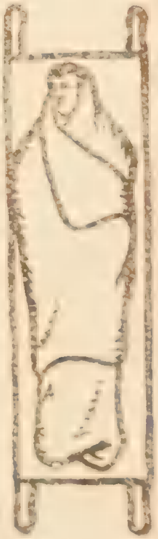

FIG. H.

INDIAN SUPPLEMENT
TO
FIRST AID
TO THE INJURED

PREFACE.

THE indications for an Indian Supplement to Sir James Cantlie's "First Aid to the Injured"—the authorised text-book of the St. John Ambulance Association, are mainly two:

First, to introduce to newcomers to India, some commonplace indigenous articles with names and uses, which are of proved value in the application of First Aid in India; and,

Second, to elaborate, for residents in the country, the knowledge of certain conditions which are very prevalent in, if not actually peculiar to, India, and which clearly call for the application of First Aid Principles.

The *first* object, it is hoped, will be attained by means of the following simple drawings, in Section I with appropriate descriptions of the significance of each. In this connection too, an actual stimulus to First Aid among the Indian peoples may possibly result from the knowledge that these familiar objects which have constantly surrounded them, possess a real, though perhaps unrealised, practical value in the alleviation of human suffering.

The *second* object can to a great extent be secured, by amplifying in Section II the existing paragraphs on Heat Stroke, Rabies, and Snake Bite, to which vast numbers of Indian and European people alike are exposed annually in India. Care has been taken to make these descriptions as straight-forward and practical as possible, and these, together with the introduction of additional information regarding Indian Poisons, form the basis of the "Indian Supplement".

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LIEUT.-COL., I.M.S.,
Surgeon to H. E. the Viceroy.

SIMLA,
September, 1934.

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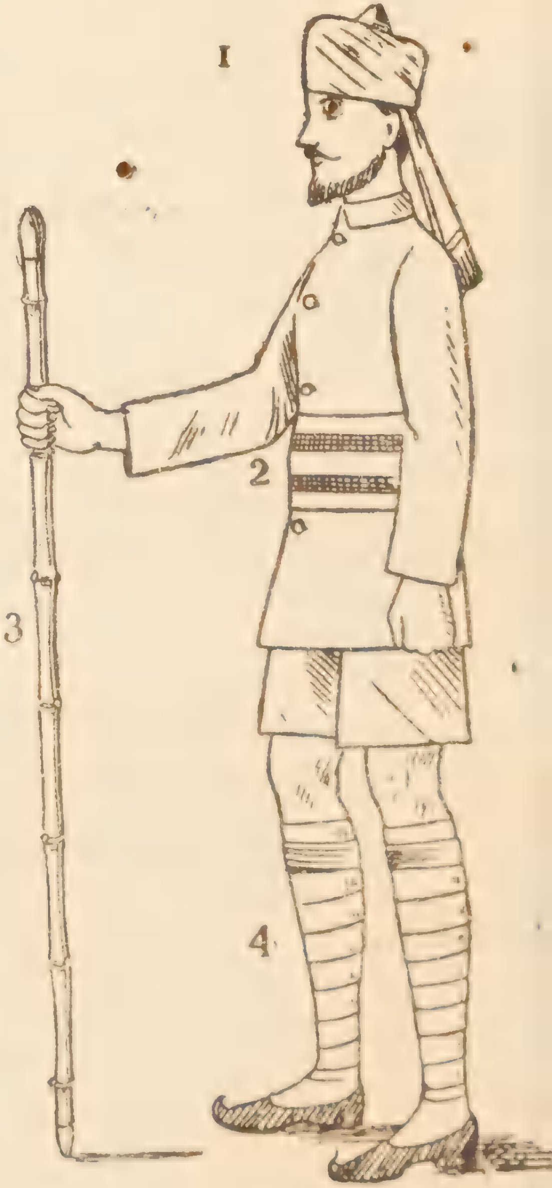
2. Kamarband.

3. Lathi.

4. Puttee.



SECTION I

INJURIES

1. *The Puggri* or Turban, consists of a length of muslin material, white, khaki, or coloured, wound round the head as a protection from the sun. The average dimensions are 7 to 8 yards in length and from 36 to 45 inches in width. It is worn by practically all communities, with the exception of Bengalis and some Madrasis, and is fashioned into distinctive designs as a uniform or Civilian head-dress.

First Aid Uses.—As improvised Bandages, Slings or Tourniquet.

To tie up Epileptics or cases of Mania.

When folded, can be used to lift bodily, an injured or insensible person for a short distance, slung on the carriers' back.

2. *The Kamarband* is a girdle or waistband, worn in a great variety of designs and materials, usually gaily coloured and distinctive When

in cotton, it varies in strength from that of fine muslin to close woven webbing, while in wool it may be of the nature of a shawl or of stout serge. It may be of single width and go once only round the body, on the other hand it may be folded to a width of from 4 to 6 inches, and worn long enough to encircle the waist several times. It forms a part of practically all Indian Uniforms, Military, Civil and Police, and it is worn as a regular garment by domestic and public menial servants and followers, when dressed for duty.

First Aid Uses.—Are the same as those of a *puggri*, but as the material is usually more robust, it is better suited for improvised Binders for the Chest or Pelvis, and as padding.

The webbing variety can be used as an improvised seat or sling, for hand carriage of the injured over a short distance.

3. *Lathi* is a stout staff or pole, generally of solid male bamboo, and often shod with metal cap and ferrule. It is carried by

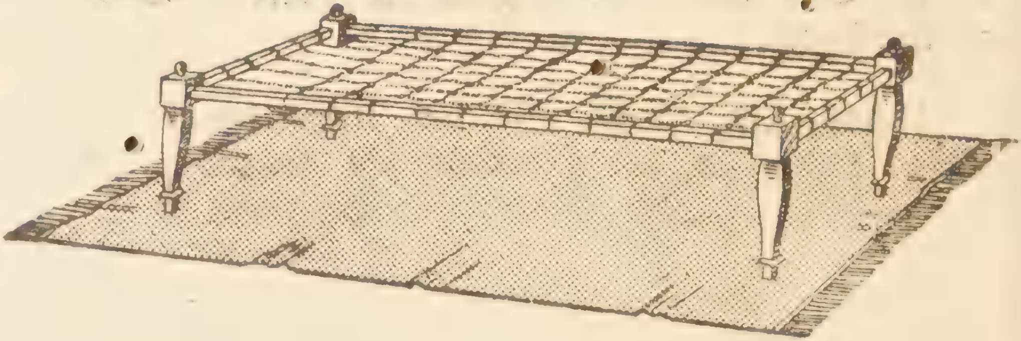
peasants of all communities and by police, being used as a weapon or walking stick. It is also used to support a bundle carried on the back.

FIRST AID USES.—As an improvised long thing splint, or as a temporary crutch. Two can be used as improvised stretcher poles.

4. *A Puttee* is a strip of woven cotton or woollen cloth of 3 or 4 yards in length, and about 4 inches in width. When completely wound on the leg it is secured by a tape of about 4 feet long. It is worn as a gaiter extensively by troops and police when mounted or dismounted, and by menial servants when travelling on duty, with or without boots and shoes.

FIRST AID USES.—As a Roller bandage of great strength, for binding limbs or fixing splints. Also can be used as an improvised tourniquet.

The Charpoy is the common Indian bedstead, and consist of 4 conical legs, from 1 to 1½ feet in length, each surmounted by a cubic block, drilled to receive connecting cross poles. When assembled, it measures



Charpoy. Durree.

from 5 to 6 feet by 4 to 5 feet. It may be constructed of crude or elaborate materials. The "mattress" consists of a net-work of country grass twine, or strips of white cotton braid, attached to the frame. It can easily be lifted and carried on the head of one man. It is used by rich and poor of all communities and is found, not only in living rooms, but in railway stations, police posts, office verandahs, military lines, etc. It is met with wherever the rudest habitations exist, even in deserted places like old temples and jungles

FIRST AID USES.—

(1) As a temporay couch or seat on which to attend to injuries of all kinds.

(2) As an improvised stretcher on which the sick or injured can be carried long distances in comparative comfort.

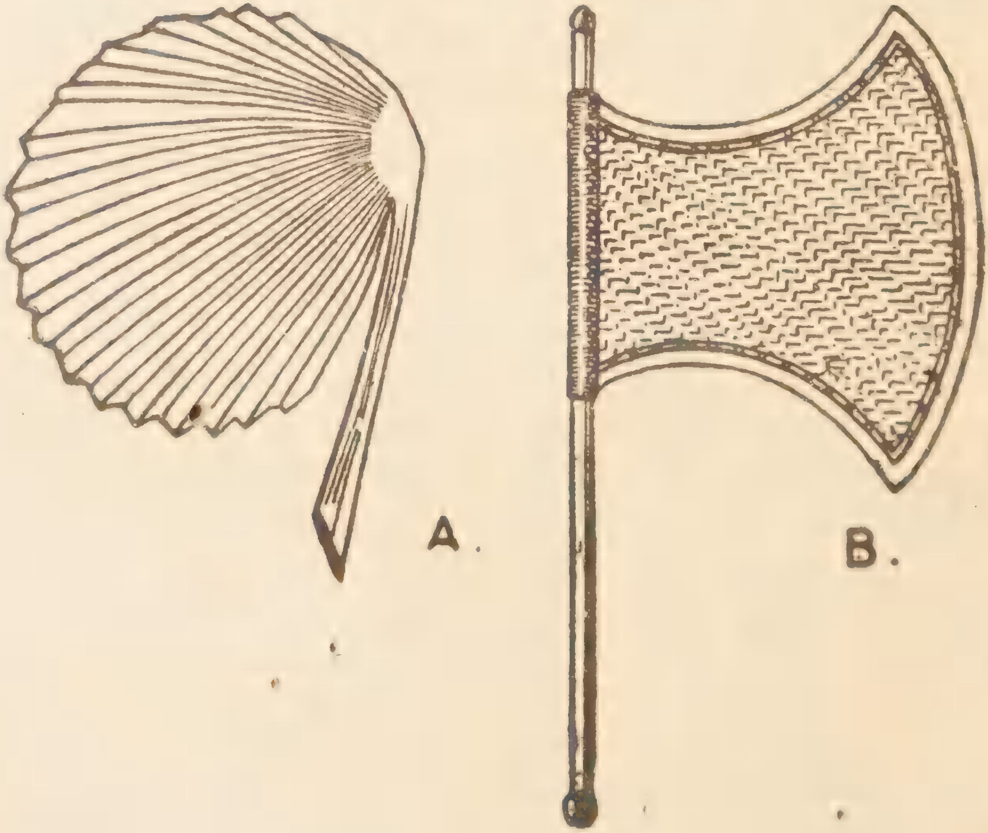
(3) As temporary hospital bed in large scale disasters, *e.g.*, earthquakes.

(4) With the addition of a water-proof ground sheet, as part of equipment of an improvised heat stroke station.

The Durree is the poor man's carpet, mat, or bed spread. It commonly consists of cotton cloth, close woven with striped patterns of all colours. The size varies with the function, from that of a small beside mat, to the floor-covering of an entire room. The long edges are usually bound, and the short edges fringed. It is highly resistant to wear, tear and stretching, and is found in practically all Indian houses.

FIRST AID USES.—As a fire extinguisher when a person's clothing catches fire. As the cloth for an improvised stretcher, or as a hammock-like sling for bodily lifting an injured or insensible person a short distance away from the source of danger.

AIR.

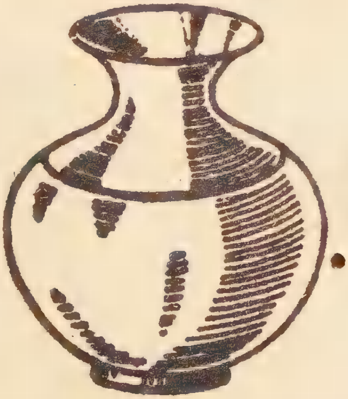


Hand Punkhas.

Hand Pankha.—In its most primitive form "A" it is made from the leaf of the palmyra palm, the leaf stalk forming the handle. "B" represents a refinement, of plaited date palm straw, shaped somewhat like a battle-axe and mounted on a handle of brightly coloured lacquered wood. It is carried by all classes during hot weather, and is also used for fanning fires to greater intensity.

FIRST AID USES.—Wherever stifling conditions prevail and air is required, *e.g.*, fainting, heat exhaustion, etc. Where a current of air is required to cool the body by evaporation from the surface. In the absence of electric power, in heat stroke stations.

WATER.

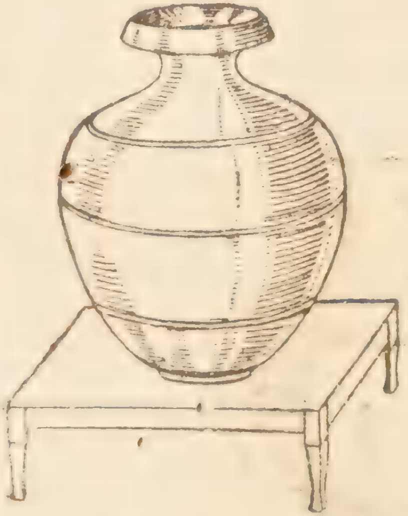


Lota.

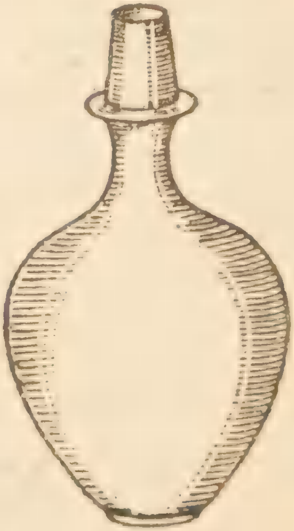
The "Lota" is a small spheroidal metal water pot, universally used for the carriage of small quantites of water for washing or drinking purposes. It is also used for boiling or heating water.

First Aid Uses.—For the provision of small quantities of boiled water to wash wounds. As an improvised lotion bowl, or to boil up small instruments for sterilization.

A "Ghara" is a large, fragile, earthenware vessel, of varying shape and size, used for the



Ghara.

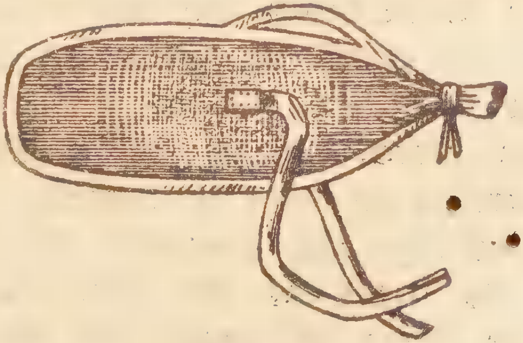


Surahi

cooling and storage of drinking water. Being porous the vessel sweats, and in hot dry conditions, water is cooled to a very pleasant temperature by evaporation. This can be assisted by placing in a draught or current of air from a fan. It is carried on the head by coolie women. When provided with a bottle neck and expanded base, it is termed "*Surahi*".

First Aid Uses.—Wherever a liberal supply of cold water is needed, in all conditions producing thirst, and as part of the equipment of heat stroke stations.

A "Chhagul" is a collapsible canvas water bottle, with a pouring handle, two canvas slings, and a tapering neck, fastened by a cord. It forms part of the equipment of an Indian

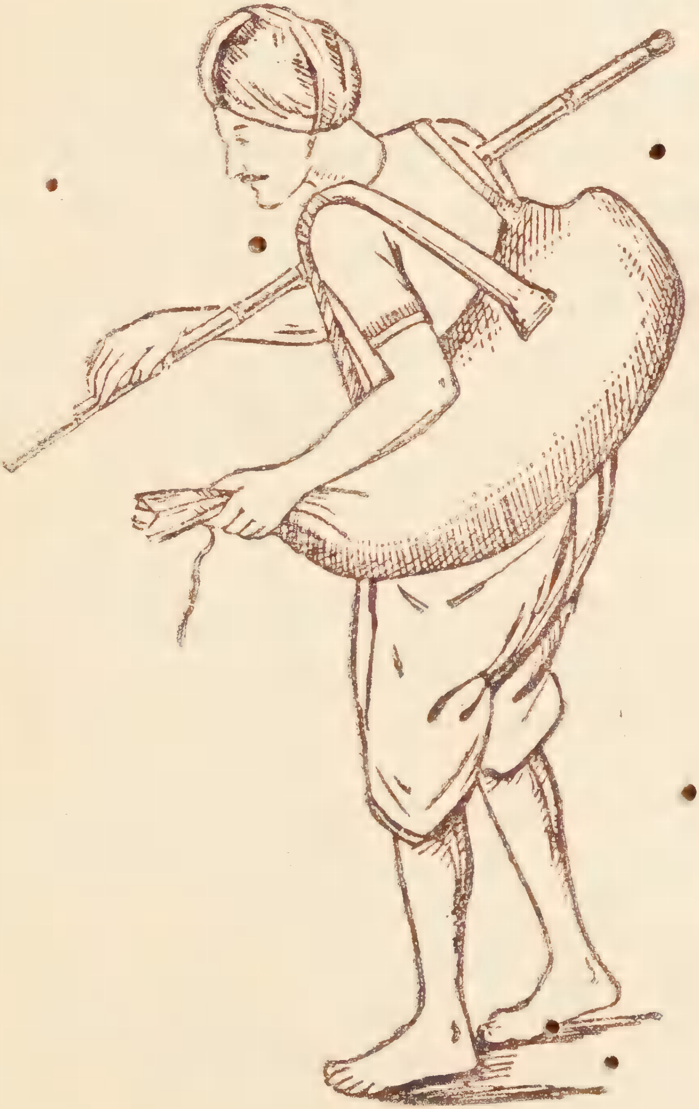


Chhagul.

cavalry unit on the march, when it is slung round the horse's neck or belly. It can be tied to motor cars, trains, etc., and can be slung under trees in a breez, or suspended from a beam and swung to and fro in a building, all with the object of rapidly cooling water by evaporation, from the surface of the canvas, through which the water percolates. It is important that it should be thoroughly soaked for forty-eight hours in water before use, and kept continuously filled. It can be hung in the draught of a fan for more rapid cooling.

FIRST AID USES.—These are the same as for a "ghara" but the "chhagul" is far more generally useful on account of its portability and is therefore strongly recommended.

The "Mashak" or *"Mussuck"* consists of a leather bag made from the entire dressed skin of goat, or of cowhide, slung on the back of the Indian domestic water-carrier or *Bhisti*. It contains from 12 to 16 gallons. Larger sizes are carried on cows or camels. The water is controlled by the pressure of the Bhisti's hand on the neck of the sac, so that the quantity or force of water can be released as



Bhisti with Mashak.

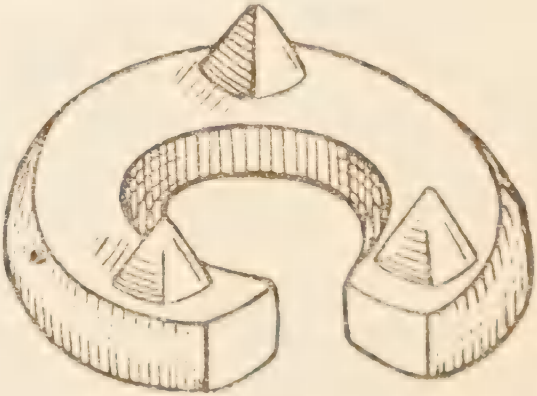
required. *Bhistis* with "mashaks" are employed in military, civil and railway establishments, and as private servants all over India, and furnish a walking water supply.

FIRST AID USES.—Wherever a large supply of water is urgently needed to be brought from a distance, *e.g.*, in large scale accidents like earthquakes, railway disasters, explosions, etc. In heat stroke stations, standing camps or in military operations.

Cases of insensibility from narcotic poisoning can be stimulated by forcible splashing from a "mashak", over the face or body.

FIRE.

A "Choola" is an extemporised cooking

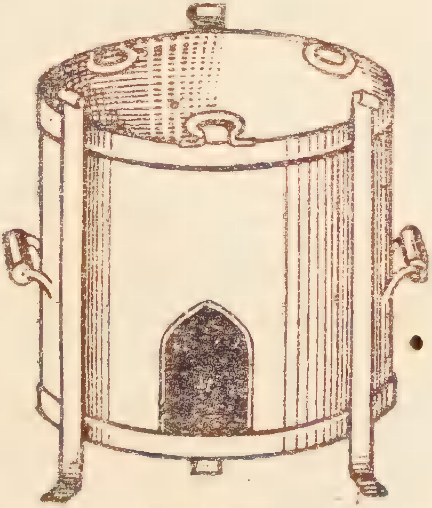


Choola.

place of clay, shaped into a rough horse-shoe ring, which may be constructed anywhere. It is found in practically all Indian houses in more elaborate form, as a fixture. The fuel consists of sticks and cow dung cakes, and a fierce heat can be generated by fanning with a hand "punkha".

FIRST AID USES.—As a universal source of heat for boiling water for sterilization.

The "Sighree" is a portable iron charcoal brazier, more frequently met with in towns and civilised communities. It is used for cooking and for drying purposes.



Sighree.

First Aid Uses.—To provide a large supply of heated or boiled water. The danger of using this as a source of heat in a closed space is the production of carbonic acid gas, which causes asphyxia.

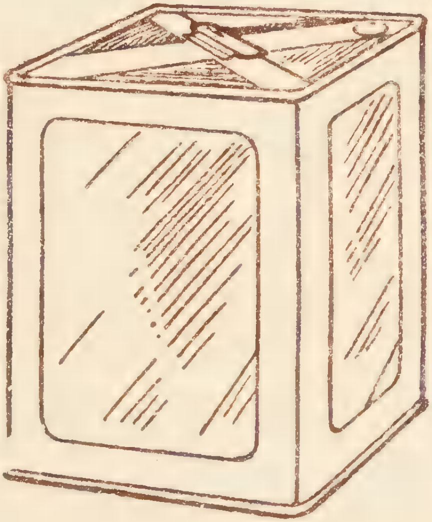
The "Degchi" is a universal cooking pot of metal made of copper (tin plated), brass, or aluminium, and supplied with a covering metal lid shaped like a plate.

Degchi.

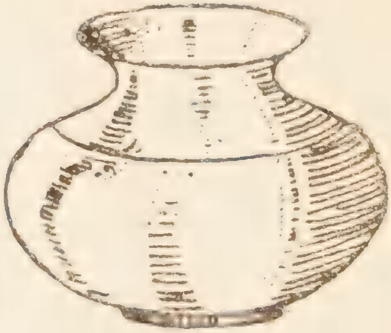
First Aid Uses.—Large quantities of hot water for its various purposes can be heated in this, over a "choola" or "sighree". Instruments and other articles can be sterilized by boiling in a "degchi".

OIL.

Ghee is boiled, clarified butter, which when cool, sets to an opaque lard-like consistency, and which melts to a clear straw coloured liquid at low temperatures. It is the universal medium of cookery, throughout India, and is practically always obtainable. In bulk it is transported and stored, in converted kerosine oil tins, while in domestic houses it is stored, as a rule; in earthenware crocks called *chattis*.



Ghee Tin.



Chatti.

First Aid Uses.—Warm liquid *ghee* takes the place of salad oil in India in the treatment of poisoning by corrosives.

SECTION II

CHAPTER I.

"Effects of heat".

Confusion still exists as to the terms *Sunstroke, Heat Exhaustion* and *Heat Stroke.*

Sunstroke implies exposure to the direct light and heat rays of the sun and can occur independently of high surrounding temperatures. *Heat Exhaustion* and *Heat Stroke* both occur as result of exposure to high surrounding temperatures and are conditions not necessarily dependent on exposure to the direct rays of the sun.

(*a*) SUNSTROKE.

Sunstroke is an unsatisfactory term for a condition which arises as a result of the combined effects of the direct light and heat rays of the sun on, or through, insufficiently protected surfaces of, the body. Some authorities confine the term sunstroke to the effects of light irradiation only, but the established, though unsatisfactory, term cannot be altogether restricted to the effects of light.

While sunstroke does occur independently of high surrounding temperatures, it is commoner in the tropics on account of the greater intensity of the light and heat rays. Again, in the tropics, sunstroke is often combined with effects of heat. When so combined, such cases are best regarded and treated as Heat Exhaustion or Heat Stroke, (to be described later) with the superadded effects of the direct rays of the sun on the cerebro-spinal system.

In the absence of high temperatures the sun's rays may produce superficial burns and blisters, varying degrees of headach, and even temporary blindness as result of glare.

Aggravated sunstroke, as met with in the tropics, is often followed by symptoms suggesting definite congestion of the brain, *e.g.*, intense headache and vomiting which may not come on for several hours after the exposure to the sun. Headache may persist for months after exposure.

Treatment.—This is largely preventive. Skin surfaces should be protected by suitable clothing. Sun helmets and spine pads should be worn when exposure to the sun is necessary or expected. Tinted glasses protect the sensitive nerve tissues of the eyes from glare.

Active Treatment.—Superficial effects of sunburn can be alleviated by the use of cooling lotions and cold creams.

With deeper seated effects such as delayed headache and vomiting, send for a doctor and apply ice cap or "chhagul" filled with cold water to the top of the head, after removing the patient to cool shaded surroundings.

When combined with Heat Exhaustion or Heat Stroke, apply the appropriate treatment (*see later*).

(*b*) HEAT EXHAUSTION.

Heat exhaustion (or Heat collapse), never occurs apart from exposure to heat. It is a pure syncope on a hot day, or it occurs as a result of unsuitable clothing, in an overheated stuffy room, or in a crowded train or space. It occurs among workers in stuffy atmospheres or amongst troops on the march or on parade.

Symptoms.—Heat exhaustion comes on suddenly, after preliminary giddiness with fainting and pallor. The most striking fact is, that even on a very hot day, the skin, in heat exhaustion, is both cold and clammy, in complete contrast to the dry hot skin of heat stroke. The temperature is normal or subnormal, and the pulse is rapid and weak.

Treatment.—Preventive. If exposed to sun plus heat, the same precautions as for sunstroke should be taken. Loose, sensible clothing should be worn and large quantities of water should be drunk. Marching or exertion should be reduced to a minimum during the hot hours of the day.

Active First Aid Treatment.—Remove patient to cooler conditions in the fresh air if possible. Lay him down, loosen all clothing about the neck. Dash cold water on the head and neck to stimulate, but not to chill. Fan him vigourously. Recall the treatment for Syncope and Collapse. If severe, apply treatment for Shock, with hot bottles and stimulants.

(*c*) HEAT STROKE.

Heat stroke proper is an entirely different reaction in the human body, to the same conditions which favour Heat Exhaustion. It is a complicated, more serious, and often fatal condition.

To understand it, a preliminary explanation of what is called the heat regulating mechanism of the human body in health, is essential.

Heat is generated all through life by food and exertion, and the temperature of the body is maintained at normal, by means of a nerve centre at the base of the brain, which controls the requisite loss of heat from the body, automatically. When external conditions are hot and threatening, the pores of the skin open, and perspiration starts. Cooling by surface evaporation results, but can only be maintained provided the surrounding atmosphere is not excessively hot, is moving, and reasonably dry; and, provided that the supply of body fluid is constantly maintained, to balance the continuous loss from surface evaporation.

If this is understood, there will be no difficulty in appreciating why a hot, still, humid, saturated atmosphere nullifies this water-cooling arrangement and why it is so important to maintain an adequate intake of drinking water when these conditions prevail.

This source of cooling is based on physical laws, but the delicate nerve mechanism can only function automatically under conditions of perfect health.

If added to the strain of heat conditions mentioned above, the nerve centre should be over-stimulated by alcohol or depressed by body poisons circulating in the blood, then it is easily put out of gear.

Alcohol is not merely apt to over-stimulate the centre, but it is a food, and generates heat accordingly.

Any inter-current illness, *e.g.*, malaria, favours heat stroke, by depressing the heat regulating centre.

Constipation, however, is by far the most frequent additional factor met with, as a source of circulating poison, and it is not too much to say, that every case of heat stroke is constipated.

To recapitulate, then, the factors which dislocate the heat regulating centre and produce heat stroke are :—

Very high temperatures, high humidity, still air, alcohol and constipation.

The Army Medical Authorities have proved the influence of these last two factors, by showing that the incidence of heat stroke is greater amongst young soldiers, who are apt to be careless, than amongst experienced troops who have learned discretion and the importance of bodily hygiene.

A combination of these factors results in a breakdown of nature's mechanism for body cooling, and a condition of heat retention sets in, with a rapidly mounting temperature. The body, out of "heat control", is at the mercy of the high outside temperature which it cannot survive.

Heat stroke is heat retention, and having learned the conditions which contribute to it. we must now study the effects produced and how to relieve them.

EFFECTS OF HEAT STROKE.—The first noticeable effects are often mental excitement with change in behaviour. Restlessness, intolerance, and delirium are common. Distressing vomiting is a striking symptom practically always present. Muscular cramps from loss of body fluid occur in some cases. The skin at first may not be characteristic, but with a temperature repidly rising to above 104° it becomes hot, dry and even gritty, to the feel. The pulse is rapid and irregular and respiration becomes stertorous. The possibility of severe malaria should always be thought of. When the temperature reaches 106° or so, unconsciousness supervenes and the skin becomes blue from cyanosis. Unless treatment towards heat reduction etc. is successful death ensues from asphyxia with body temperatures as high as 110°.

Treatment.—Preventive treatment is the same as for Heat Exhaustion.

Active First Aid Treatment is directed towards (1) heat reduction, (2) elimination of body poisons, (3) restoration and preservation of the heat regulating centre, and (4) replacement of lost fluid.

Send for a doctor, and commence active treatment if possible before the temperature reaches 104°.

A regular routine will save many cases.

The equipment of a heat stroke station (listed below) provides the wherewithal.

Strip the patient completely naked, and lay him down on a "charpoy" which has been covered with a waterproof sheet or rough towel. Pour cold water all over the body and fan vigorously. Give a large enema, as 90% of the cases will be constipated. Apply a bed-pan, and while waiting for the result of the enema, crop short the hair of the head rapidly. Apply an ice cap or canvas "chhagul" filled with crushed ice or cold water to the top of the head and another to the nape of the neck.

After the enema has been returned, weak saline or plain water may be run slowly into the rectum to replace the fluid previously lost by evaporation, and to relieve cramps.

Sponge the whole body with cold water, and rub to promote sweating. Take the temperature frequently.

In bad cases, signs of recovery may not set in for several hours.

When the temperature comes down to 102° and consciousness returns, the cooling process should be stopped, and the patient should be dried and covered with a light blanket.

Water can be given to drink, and a purgative of Calomel (grains 5), should be given to increase elimination of poisons.

The patient is not considered out of danger for one or two days after an attack and usually has irregular fever and may have relapses.

Bad cases often show prolonged mental and physical disablement after very high temperatures, hence the importance of recognising Heat Stroke before it becomes far advanced, and of commencing treatment early.

Equipment for an Improvised Heat Stroke Station.

Charpoy	1
Waterproof Sheet	1
Rough Towels or Cotton Sheets	2
Gharas, large, for water	4
Lotas or Tin mugs	2
Chhaguls	6
Bed-pans	1
Hand Punkhas	4
Enema Syringe	1
Thermometer	1
Ice Box	1
Large Scissors	1

The above articles are all easily obtainable anywhere in India and most have been described and illustrated in Section I.

Where Heat Stroke is expected in hot stations during the steamy months of the year, a permanent building can be fitted up in anticipation, with various fixtures, such as electric fans and other air-cooling devices. In the absence of electric power, a thermantidote may be used. This consists of a box-like structure fitted accurately to the door of a room and driven by hand. The fan blades are fitted on the principle of a paddle inside the box, and when rotated, air is drawn through wet side-screens made from a root called "Khas-Khas", and delivered cold, into the interior of the room.

CHAPTER 2.

RABIES AND DOG-BITE.

Rabies and Anti-Rabic Treatment in India.

Rabies, is an acute, infective, fatal disease of dogs, jackals, wolves, horses, monkeys, and other animals, communicated to man by bites and scratches from these infected animals, or by licks on pre-existing abraded surfaces *e.g.*, rag-nails, cuts, etc.

The poison or virus, is probably an ultra-microscopic organism, contained in the saliva of these infected animals, which gains entrance to the system through the abraded skin surfaces of the victim.

Pasteur, about 1885, proved that rabies was essentially an infection of the central nervous system, and that the pathway from the skin to the brain and spinal cord, was *via* the terminal nerve endings, and up along the parent nerve trunks. Pasteur explained the added risk of abrasions on the face or head, by the fact that these short nerve trunks provided the shortest possible route, by which the poison could reach the brain.

The Effects of Infection.—In man, the effects produced vary, according to the region bitten, the extent of laceration, and the virulence of the poison absorbed. The amount of poison applied is modified in the case of bites through clothing.

Symptoms.—There is always an interval between the date of the bite and the first appearance of symptoms, known as the Incubation period and this varies from fifteen days to eight months.

When symptoms do appear they may be differentiated into three stages :

(1) The Invasion State :—There may or may not be increased irritation or pain in the region bitten. Restlessness, insomnia, quickened pulse and slight fever are common.

(2) The Excitement Stage :—Follows in one or two days and lasts as long.

Restlessness becomes intense with great mental excitement. Hypersensitiveness to any stimulus (*e.g.*, noise, light, etc.) sets up distressing spasms of the muscles of the throat and respiration. Consciousness unfortunately remains clear.

(3) The Paralytic Stage:—This is the result of exhaustion, followed by heart failure in a matter of one or two days. The developed disease is incurable.

In rapidly fatal cases these stages may run to one another so closely as to be indis-rguishable.

Symptoms in the Dog.—It is most important consider the symptoms of rabies in dogs, ecause the dog is the most frequent infecting gent of man. A dog may be infective for one eek before any symptoms develop.

Two types in dogs are described:

(1) Dumb Rabies, in which paralytic features predominate; and,

(2) Furious Rabies in which irritation of the brain, with resulting excitement, is most evident, followed later by paralysis, and, of course, death.

In the case of domestic dogs, there is usually a stage of "Hot Nose" and refusal of food, as an early sign, which is a most important fact to remember in the preventive treatment. Restlessness ensues rapidly, and the dog wanders about anxiously. This is accompanied by a change of expression, wrinkling of the eyebrows and a hunted look. Change in the usual disposition of the dog is very suggestive, and the dog is apt to make unprovoked attacks at this stage.

More furious manifestations follow, in which the dog tears at its bedding, chews up its water tin and even snaps at imaginary objects. Staggering gait, as result of paralysis of the hind legs, appears early. Spasms of the muscles of the throat produce an altered tone in the bark, as a later feature. General convulsions of all the muscles of the whole body precede death, which invariably takes place within ten days, and usually in about five days.

The outstanding feature of rabies in a dog is the unexpected onset of a disease which ends fatally, with some of these symptoms, in from two to five days.

A very rapid unaccountable death in a dog may be due to snake bite.

Treatment.—Prevention is everything in dealing with rabies, as the disease is always fatal.

First: Prevention of Biting—This can only be made absolute by exterminating all biting animals which is impossible. In the large majority of cases the biting animal is a dog and a pet one at that.

A dog should never be kept in a household in India with young children. They have natural instinct to pet and fondle a pet dog, and they court the disaster of bites about the face, which are by far the most dangerous.

Then in districts where infected jackals abound, it is not advisable to keep a dog at all.

Every dog owner in India should know about rabies, and realise his responsibility. He should remember the early symptoms of rabies in the dog.

If the dog has a hot nose, is off colour and refuses its food in India, it should always be chained up, and the following precautions should be taken at this stage :—

When giving the dog medicine, thick leather gloves to protect the hands should be used. The dog's food plate, or drinking bowl, should be pushed within its reach with a stick, and the dog should be handled as little as possible.

These procedures will prevent the dog from biting the owner or any one else, should rabies subsequently develop.

If the dog's appetite and normal condition return, then, and then only, should it be released.

On the other hand, if suspicious symptoms develop, keep the dog chained up and out of harm's way, and send for a doctor or veterinary officer.

If there is a shadow of doubt they will order the dog to remain chained up for ten days, especially if it should have bitten any one.

This is not only a measure of protection, but it affords the best possible evidence of rabies in a dog. No dog with developing rabies will survive ten days (few will survive five days), so, even if the dog should have bitten someone, and is alive and well after ten days on the chain, it can be pronounced non-rabid to the relief of all concerned.

So much for the prevention of dog bite itself.

Unfortunately advice is first sought after the damage has been done. Someone has been bitten, and prevention of another kind is called for, namely, the prevention of the possibility of the entrance of the virus of rabies into the system of the victim. In other words, one's immediate concern is now the protection of the bitten.

First Aid Treatment.—Immediate First Aid is of the greatest value.

Send for a doctor and commence active attention to the wound.

Wash the whole abraded surface with soap and water, whether licked, scratched or lacerated.

If pure carbolic acid is available, paint carefully the abraded surfaces and edges of the wound by means of a match, or slip of split cane, dipped in pure carbolic acid. If the wound is penetrating, do not omit to paint the sides of the depressions, and probe to the bottom of each tooth mark.

Pure carbolic acid cauterises and destroys all organisms on the surface, and any which may have penetrated a short distance into the tissues. It stings on first application, but soon becomes anæsthetic. It should be used most sparingly, if at all, in the neighbourhood of the eyes.

If pure carbolic acid is not available, an actual cautery consisting of a red hot poker for superficial wounds, or a red hot knitting needle for penetrating wounds should be applied.

Crystals or a saturated solution of permanganate of potash may be applied. Other strong antiseptics recommended are silver nitrate and strong nitric acid.

All animal bites should be so treated, both on account of the possibility of rabies, and to prevent septic infection.

If the above instructions are quickly and carefully carried out, there is every reason to believe that the risk of infection by rabies will be very greatly reduced.

At the same time, collect all possible information regarding the circumstances of the bite.

POINTS OF PRACTICAL IMPORTANCE.

1. Verify if the attack was unprovoked, or merely the result of teasing the animal—an important distinction.

2. If the bite is caused by a wild animal or stray dog which subsequently makes off, then it is best to assume that it was rabid, especially as there is then no opportunity of carrying out the ten days' test, or the examination of the brain of the biting animal.

3. If the dog is known, insist on the owner's chaining it up for the doctor's inspection, and to prevent any further mischief.

4. If the biting dog or other animal is obviously rabid, have it shot but not in the head if possible, because subsequent examination of the brain is of value in confirming the diagnosis of rabies.

By attending to these points you will be in a position to assist the doctor on his arrival in his decision as to whether the case is, or is not, one for Pasteur's Anti-Rabic Treatment.

Though the risk of developing rabies in many cases may appear infinitesimal, a course of Anti-Rabic Treatment will be recommended by most doctors in the large majority of cases, and every assistance should be given to carry out the doctor's advice.

The Government of India have so provided, that this treatment is now available throughout the country. Not only have the number of Pasteur Institutes been increased, but the protective anti-rabic vaccine is now obtainable from a great many additional centres at civil and military hospitals and may be administered by general practitioners.

One final situation arises, where a pet or valuable dog has been bitten by a possibly rabid animal. In such a case the same treatment by cauterisation may be carried out, but the owner should wear thick leather gloves whenever handling the dog. The reason for this is, that not only the wounds, but the dog's hair is certain to be impregnated with saliva, which may be highly infective. The opinion of a veterinary officer should always be obtained by an owner to decide the question of the after-care of a bitten dog.

Anti-rabic treatment for Dogs is available.

CHAPTER 3.

Indian Snakes and Snake Bite.

No. 1 Examination.
BELLY.

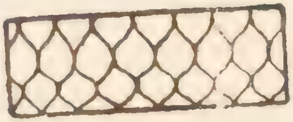


Fig. 1.

Fig. 1. **Non-Poisonous** Scales, large or small, are continuous with those of back and sides, and uniform across the belly.

Do.

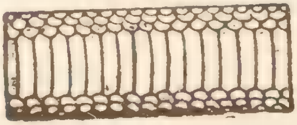


Fig. 2.

Fig. 2. **Non-Poisonous** Combination of small scales and transverse shields are seen on belly surface, but the transverse shields do not monopolise belly surface.

Do.

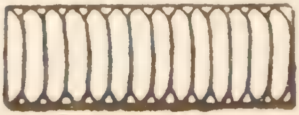


Fig. 3.

Fig. 3. **(Poisonous ?)** Transverse shields extend completely across from side to side occupying entire belly surface to the tail.

No. 2 Examination.
TOP OF HEAD.

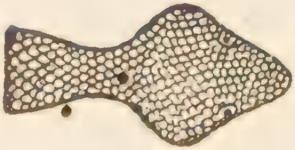


Fig. 4.

Fig. 4. **Poisonous.** Top of head arrow shaped. Broader than rest of body which it joins by a constricted neck. Head covered with small scales. Common to all Vipers, except Pit Viper.

TOP OF HEAD.

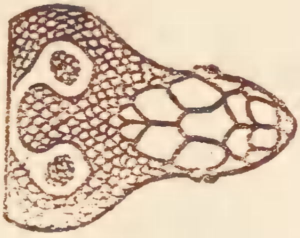


Fig. 5.

Fig. 5. **Poisonous.** Top of head oval, smaller than rest of body. Streamlined without demarcation of neck. Covered with big shields. If neck passes into expanded hood, then Cobra. Common Cobra has 'Spectacles'. King Cobra without.

Do.

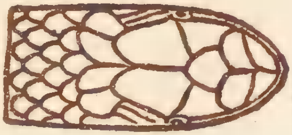


Fig. 6.

Fig. 6. **Poisonous.** Same as 5. Only *no* expanded hood.

No. 3 Examination.

SIDE OF FACE.

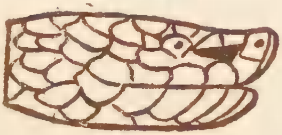


Fig. 7.

Fig. 7. **Poisonous.** Shields on side of face. Tip tilted Nose with well-marked "Pit" between eye and nostril. Pit Viper.

Do.

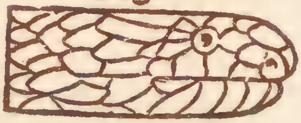


Fig. 8.

Fig. 8. **Poisonous.** Compare with Fig. 6, and note general streamlining of face and head with neck. Absence of "Pit", probably Krait.

No. 4 Examination.

BACK.

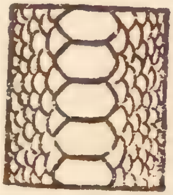


Fig. 9.

Fig. 9. **Poisonous.** Central row of large shields occupy midline of back. With foregoing features can be regarded as a Krait.

Snakes and Snake Bites.

It is not considered essential that the First Aid worker should approach this subject with the eye of a trained naturalist; at the same time it is most important that he should be able to distinguish at once between the non-poisonous and the poisonous snakes, and that he should have a working knowledge of the latter.

The key for identification should invariably be used systematically, and examinations of snakes should in all cases follow the definite sequence of: 1st, the belly; 2nd, the top of head; 3rd, the side of face, and (lastly) 4th, the back, before any supplementary features such as colour or markings are considered at all. The importance of this will become apparent.

EXAMINATION No. 1. THE BELLY.—

If the arrangement of scales conforms to either Fig. 1 or Fig. 2, then the snake can be pronounced non-poisonous straightway, and further investigation can cease, as anxiety is at an end. If, however, the scales resemble the appearance and description of Fig. 3 then attention is at once directed to the poisonous varieties

Before proceeding to examination No. 2, it is well to remember that the important poisonous land snakes of India are six in all, divided into two main families: (*a*) Viperine and (*b*) Colubrine, also that for practical purposes, we are concerned with three in each family.

In the Viperine group there are two vipers: (Russell's Viper and the Pit Viper) and a snake called an Echis Carinata, while in the Colubrine group, there are two cobras (Common Cobra and King Cobra) and a snake called a Krait.

EXAMINATION NO. 2. THE TOP OF HEAD.—

This examination gives the distinguishing characteristic of the two main families.

Fig. 4, with annexed description, applies to all three vipers, except the Pit Viper, which requires further confirmation—(*see later*).

Fig. 5, with annexed description, identifies the two cobras, while,

Fig. 6, raises a strong suspicion that the snake is a krait.

At the conclusion of examination No. 2, one should have accounted for two out of the three vipers, and both the cobras in the Colubrine group. Consequently one is left with one remaining viper and one remaining Colubrine which can be distinguished by examination No. 3.

EXAMINATION NO. 3. SIDE OF FACE.—

Fig. 7, with description, identifies the last remaining viper, *i.e.*, the Pit Viper. Its main departure from the Viperine group description is, that it has large shields instead of small scales on the top of the head and side of face, a tip-tilted nose, and a deep pit between eye and nostril. This combination of features is quite distinctive.

Fig. 8, showing large scales on the side of face, a rounded profile with a streamlined head and neck, strengthens the suspicion, aroused at Fig. 6, that the snake is a krait.

Logically, the one remaining Colubrine should be a krait, as all three vipers are now accounted for, and both cobras were disposed of at the end of examination No. 2, but at least one final examination is necessary for confirmation.

EXAMINATION NO. 4. THE BACK.—

Fig. 9, with description, shows an arrangement of shields occupying the mid-line of the back, which when combined with the previous characteristics of the krait, are sufficient to identify it. Many experts would not rest content with these four examinations, and would insist for verification of a krait on a fifth examination of the arrangement of the scales on the upper and lower lips.

For First Aid purposes, however, it is considered that if an individual is bitten by a snake which conforms to the appearance of Figs. 3, 6, 8 and 9, it is better to assume that the snake is a krait, and to proceed with treatment at once, rather than wait for what amounts to a laboratory examination.

In reviewing this system of rapid examination of the poisonous snakes, it will be seen that one examination only is required to exclude all the non-poisonous snakes. Two examinations identify both cobras and two out of the three vipers. Three examinations are required for the pit viper while all four examinations are necessary to identify the krait. In other words, the krait is the most difficult of the six poisonous snakes to identify.

Having thoroughly mastered the "key" and its application, the time has arrived for a short general description of each of the poisonous land snakes met with in India.

(A). Vipers are usually short in length. All are poisonous and have tubular fangs.

(1) Russell's Viper (or "Daboia") is found all over India. It is the longest and most poisonous viper. It varies from 1 to 5 feet in length. Reddish

brown in colour, it has three parallel chains along back and sides of body of diamond shaped blotches edged with white.

(2) Echis Carinata (or "Phoorsa") is met with in Northern India but is not very common It seldom exceeds 2 feet in length and is less dangerous than Russell's Viper. It has a dart-shaped white blotch on the top of its arrow-shaped head, outlined in black.

(3) Pit Viper (or Ancistrodon) named on account of the pit between eye and nostril, is a tree viper found in Ceylon and the hilly districts of Southern India. It may be 3 feet in length, is not very formidable, and seldom causes death.

(B). Colubrines are usually large and very poisonous with grooved, not bored fangs.

(1) Common Cobra (or "Naja") is found all over India and the Himalayas.

Long cylindrical bodies up to 6 feet in length, hooded and with spectacle markings on the hood.

(2) King Cobra (or "Hamadryad") is found in Lower Bengal, Assam and Burma. May be 15 feet in length, and with Common Cobra is the most poisonous of all Indian snakes.

(3) Krait (or "Bungarus") is found in Northern India and Sind.

There are two varieties, both very poisonous: The Common Krait may measure 4 feet in length, and has a series of white arches over the back, well marked towards the tail. The Banded Krait sometimes measures 6 feet. It is a yellow snake with blake rings or bands encircling the body.

Sea Snakes are all poisonous, but seldom attack man. They are specialised for their habitat. Head is small, nostrils on the surface and the tail is flattened from side to side.

EFFECTS OF SNAKE VENOM AND FIRST AID

TREATMENT OF SNAKE BITE.

The effect of Viper venom is quite different from that of the Colubrine group.

Viper venom acts chiefly on the blood and blood vessels. When injected into the tissues, there is therefore a local reaction of marked discolouration and hæmorrhage round the punctures. It prevents the blood from clotting, and sets up a general effect of acute poisoning as shown by vomiting and collapse, with dilated pupils. If recovery takes place, there is local sloughing and gangrene round the bite. Paralysis is rare.

Colubrine venom is a very rapidly absorbed nerve poison.

Severe pain follows the bite, with nausea and vomiting, and the onset of paralysis of the legs is rapid. This ascends rapidly to the brain with paralysis of the face muscles, and dribbling from the mouth. The pupils are contracted. Respiration is rapidly extinguished, while the heart may continue beating for a much longer period.

If recovery takes place it is complete.

Recovery depends on the amount of venom injected in both cases while very rapid death is due to large doses, or may be due purely to fear.

First Aid Treatment.—Send for a doctor.

Rapidly identify the snake.

If poisonous, treatment must be both prompt and vigorous to prevent the spread of the venom throughout the body and to neutralise the poison if possible.

1. If bitten on a limb, immediately arrest the circulation in the arteries and veins, by means of a constriction placed round the upper arm or thigh (as the case may be), between the wound and the heart, but not round the forearm or leg.

The constriction may consist of rubber tubing or elastic braces, or of non-elastic strips of clothing *e.g.*, puggri, puttee, a tie, or handkerchief, tied loosely round the limb, and tightened with a stick (as in an improvised tourniquet).

The constriction should be kept in position for 20 minutes, then released for one minute or until the skin becomes pink, and again tightened. Repeat this procedure till the arrival of the doctor.

2. Immediately the constriction is applied, wash the wound with a solution of potassium permanganate in order to remove any venom which may have dried on the skin, and in addition, make an incision ¾ inch deep into the bitten area with a sharp knife or razor blade, and rub crystals of potassium permanganate into the incision as a neutralising agent. Any hæmorrhage will be controlled by the constriction.

3. Keep the patient warm and absolutely at rest.

4. If he is able to swallow, give hot drinks such as strong coffee, tea or milk. Alcohol should be avoided.

5. Re-assure the patient with encouraging words, as natural alarm will seriously aggravate his condition.

6. If breathing is failing, apply artificial respiration.

If the bite is elsewhere than on a limb, *i.e.*, where constriction cannot be applied, then adopt rules 2, 3, 4 and 5, but do not incise the wound until the doctor arrives.

CHAPTER 4.

Common Poisons in India.

Arsenic and Opium account for the largest number of deaths from poisoning in India. Arsenical poisoning is the commoner of the two, except in Bengal, which is an opium-eating country.

Arsenic is the chief homicidal poison, while opium is the favourite poison of suicides.

Opium poisoning is fully described in "First Aid to the Injured".

ARSENIC POISONING.

Common white Arsenic in the crude form, appears as lumps resembling white earthenware, and is easily obtainable in bazaars all over India. It is imported from the Persian Gulf, and is used for preserving skins and woodwork, for destroying vermin, and as a medicine. It is powdered down, and being practically tasteless it is easily mixed with sweets and food. Being fatal in small doses it is the commonest homicidal poison.

Symptoms.—Are those of a violent irritant in which there is always an interval of from half to one hour after taking, before symptoms appear.

Burning pain in the stomach, with vomiting and purging of blood-stained matter come on, followed by numbness and cramps in the muscles. After large doses, collapse and shock precede death from coma.

Treatment.—General rules for poisons.

Give an emetic. White of egg or warm *ghee* to drink.

In severe cases, give treatment for shock, *i.e.*, hot bottles and stimulants.

DATURA POISONING.

Datura poisoning is the third commonest poison in India, coming, however, a long way after arsenic and opium in frequency. "Datura" or thorn-apple, is common in India, and the crushed seeds are administered in food and drink by criminals, with intent to rob rather than to kill.

Symptoms.—Are those of Belladonna poisoning, coming on fairly rapidly after partaking.

Dryness of the throat, flushing of the face with a hot dry skin, and widely dilated and fixed pupils are typical. Difficulty in swallowing occurs with restlessness. Purposeless movements with muttering delirium, lead on to a condition of coma, with death from failure of heart and respiration. The pupils remain widely dilated throughout, and for days after recovery, which may take place.

Treatment.—General rules for poisoning.

Give an emetic. Prevent hypnosis by flicking with towels or cold douching. Stimulate by hot coffee or a tablespoonful of brandy. Apply warmth and artificial respiration if necessary.

INDIAN HEMP POISONING

Indian hemp is easily procured in Indian bazaars in the form of (1) "*Bhang*"—which is the powdered leaves and small stalks. (2) "*Ganja*"—the dried flowering tops which are smoked in a pipe, and (3) as "*Charas*" which is the resinous juice, expressed from leaves and branches. This is often mixed with alcoholic drinks or with sugar in sweets. In Egypt and Arabia it is termed "Hashish". It is not a common cause of death, and is used as an individual vice, and as an intoxicant preparatory to robbery.

The effects are those of a brain stimulant followed by narcosis. In the stage of stimulation, mental excitement is produced with hallucinations said to be pleasant. Laughing, singing and wild delirium are common results, while, in some cases, there are violent homicidal tendencies, in which addicts run amok. The drug is sometimes taken by assassins to induce courage, or administered to them for the same purpose.

The pupils are dilated, the pulse full and slow, and there is general tingling of the skin. Giddiness gives place to stupor, coma and death.

Treatment.—The same as for Datura poisoning.

ACONITE POISONING.

Aconite is a most virulent poison, but fortunately not commonly employed in India.

It is readily obtainable in Indian bazaars, and sold as the dried shrivelled root of the plant. It is used by native Hakims (or medicine men) for certain fevers, and it is sometimes added to some of the country spirits as an extra intoxicant.

Primitive hill tribes use aconite as a dressing for their poisoned arrows.

When poisoning by aconite is met with, it is usually accidental, but homicidal poisoning is not unknown. The crushed root is mixed with tea, or cooked with food in these cases.

The effect is first to stimulate sensory and motor nerves, with paralysing effect later, in which the centres for the heart and respiration become involved. The mind remains unaffected.

Symptoms.—Tingling of the lips, tongue and throat with marked salivation appear first. Numbness follows in the limbs and whole body, followed by loss of power. The pulse and respirations become feeble and irregular, leading on to a state of collapse.

Treatment.—General rules for poisoning.

Give an emetic and keep the patient recumbent. Counteract collapse with stimulants—strong coffee by mouth. Hot bottles and warmth in severe cases. Massage of the limbs relieves numbness.

Artificial respiration may be required.

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